

WHAT IS CLAIMED IS:

1. A drive mechanism, comprising:

an electromechanical transducer having a pair of ends in an extending and contracting direction;

5 a drive member fixed to one of the pair of ends of the electromechanical transducer;

10 a driven member which is driven by the drive member and which contacts frictionally with the drive member under a predetermined frictional force exerting therebetween; and

15 a controller for supplying the electromechanical transducer with drive pulses, wherein the controller includes a driving circuit which generates a first set of the drive pulses for driving the driven member, and includes a frictional force reducing circuit which generates a second set of the drive pulses for reducing a frictional force exerting between the drive member and the driven member.

20 2. A drive mechanism as claimed in claim 1, wherein the second set of the drive pulses generated by the frictional force reducing circuit have sinusoidal waveforms.

25 3. A drive mechanism as claimed in claim 2, wherein the frictional force reducing circuit is arranged to change at least one of a frequency and an amplitude of the

sinusoidal waveforms of the second set of the drive pulses so as to adjust the reducing amount of the frictional force exerting between the drive member and the driven member.

4. A drive mechanism as claimed in claim 1, wherein
5 the drive pulses supplied to the electromechanical transducer by the controller have rectangular waveforms.

5. A drive mechanism as claimed in claim 1, wherein
the drive pulses supplied to the transducer by the
controller have rectangular waveforms, and wherein the
10 controller is arranged to change a duty ratio of the rectangular waveforms thereof, so that the controller is allowed to drive the driven member and to reduce the frictional force exerting between the drive member and the driven member.

15 6. A lever device in which a lever member is driven by the drive mechanism as claimed in claim 1.

7. A drive mechanism as claimed in claim 1, further comprising a charge mechanism in which a spring extending and contracting in a moving direction of the driven member
20 is disposed, and in which the spring is charged by movement of the driven member.

8. A shutter mechanism driven by the drive mechanism as claimed in claim 7.

9. A drive controlling method for controlling a
25 drive mechanism which comprises:

an electromechanical transducer having a pair of ends in an extending and contracting direction;

a drive member fixed to one of the pair of ends of the electromechanical transducer; and

5 a driven member which is driven by the drive member and which contacts frictionally with the drive member under a predetermined frictional force exerting therebetween,

the drive controlling method comprising the steps of:

generating drive pulses; and

supplying the electromechanical transducer with the drive pulses, wherein a mode in which the driven member is moved, a mode in which a frictional force between the driven member and the drive member is reduced, and a mode in which the driven member rests relative to the drive member are switched over by changing waveforms of the drive pulses.

10. A drive controlling method as claimed in claim 9, wherein the drive pulses have sinusoidal waveforms.

11. A drive controlling method as claimed in claim 10, wherein the reducing amount of a frictional force exerting between the drive member and the driven member is adjusted by changing at least one of the frequency and the amplitude of the sinusoidal waveforms of the drive pulses.

12. A drive controlling method as claimed in claim 9,
wherein the drive pulses have rectangular waveforms.

13. A drive controlling method as claimed in claim 12, wherein a duty ratio of the rectangular waveforms of the drive pulses is changed so as to drive the driven member and so as to reduce a frictional force exerting between the drive member and the driven member.

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	